Individual Entrepreneurial Orientation Role in Shaping Reactions to New Technologies

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Abstract

Considerable research has been undertaken to explain and predict user acceptance of novel technologies at work. Although theoretical and empirical support has accumulated in favor of the powerful and parsimonious explanation provided by the Technology Acceptance Model (TAM), key knowledge voids remain. One factor that may be related to the adoption of new technologies, but has remained unexplored in the TAM literature, is the proclivity to behave entrepreneurially, known nominally as individual entrepreneurial orientation. The purpose of the present study is to investigate the role of individual entrepreneurial orientation in facilitating technology adoption under mandated conditions. Predictions are tested using survey data collected from knowledge workers required to use a new technology. Research directions and implications are discussed.

Keywords (Required)

Technology Acceptance Model, entrepreneurial orientation, mandated usage

Introduction

Why specific technologies are adopted while other similarly conceived alternatives fail to gain traction is a question that has concerned researchers for some time (Kulviwat, Bruner, Kumar, Nasco and Clark, 2007; Shane and Venkataraman, 2000). After many years of scholarly inquiry and substantial theoretical and empirical research, it is generally accepted that new technologies are more readily adopted when they are perceived to be easy to use and useful (Lucas et al. 2007). As knowledge in this area, commonly known as the Technology Acceptance Model (TAM) (Davis 1989; Davis et al. 1989), has expanded, increased attention is being paid to individual and contextual influences that may deepen understanding of factors and processes affecting adoption of new technologies (Yousafzai et al. 2007).

From a psychological perspective, individual proclivity towards entrepreneurial behaviors may play a major role in the adoption of new technologies. The concept of individual entrepreneurial orientation (EO) encompasses deep-rooted beliefs and values associated with a tendency to be simultaneously proactive, risk taking and innovative (Goktan and Gupta, 2013). Recent research conceives entrepreneurial orientation as a psychological construct particularly relevant to understanding individual behaviors in the workplace (Bolton & Lane, 2012). There is increasing emphasis placed on developing and encouraging entrepreneurial tendencies and practices among workers at all levels in the organization (Taatila & Down, 2012); therefore, examining individual entrepreneurial orientation is timely and practically useful.

Here, we investigate the role of entrepreneurial orientation in facilitating technology adoption in a large organization where the use of a new technology has been mandated. We link two developed streams of previously unconnected research, technology adoption (Lee et al. 2003) and entrepreneurial orientation (Kollmann et al., 2007). Stated succinctly, our argument and research question is that entrepreneurial orientation is a psychological construct that may affect how people make decisions about new technologies. Prior research has primarily examined the contingent influence of demographic factors in relation to new technology adoption (Bogozzi, 2007); we extend this line of research to include entrepreneurial orientation, and move beyond a focus on voluntary usage of new technology (Pavlou and Fygenson, 2006; Schwarz and Chin, 2007). Low acceptance of systems that are installed has often been identified as a key factor causing the "productivity paradox" encompassing uninspiring returns in new technologies based on investments by organizations (Venkatesh and Bala, 2008); therefore, our examination of technology acceptance in mandatory contexts is relevant for both research and practice. Finally, systematic research on EO is of recent origin (Goktan & Gupta, 2013), and there has never been an in-depth analysis of its role in shaping specific workplace behaviors.

Theory and Hypotheses

Introduction of new technologies is often associated with high ambiguity and unpredictability. In the early days of new technologies, it is often not even clear if the new systems or tools are needed at all. Roll-film technology, was initially considered a solution without a problem (Munir and Phillips, 2005), so very few bothered using it, and it was almost universally considered to be a failure when it was launched in the market. Even when a new technology is considered objectively superior to existing systems, it may not be accepted by users. Consider the curious case of keyboards where new and superior designs have failed to replace the more than one hundred year old QWERTY format (David, 1985). Researchers, managers, and inventors have found that simply initiating a new technological system does not fundamentally transform into people using the system (Hirschheim, 2007).

Challenges in getting widespread adoption for new technologies motivated researchers to understand the sources and nature of the problems and how they may be addressed (Lucas et al., 2007). A major advancement in scholarly examination of adoption of new technologies occurred with the introduction of the technology acceptance model (TAM) in the late 1980s (Davis 1989; Davis et al. 1989). Drawing on social psychological research and concerned primarily with adoption of information technology, TAM focused on two core variables, perceived usefulness and perceived ease of use, to predict the extent to which people will adopt the new system (Venkatesh et al. 2007). The simplicity and understandability of focusing on two variables to predict a complex phenomenon like technology adoption made TAM a popular studied framework.

Over time, TAM research has provided theoretical foundations for understanding reactions to new technologies in a wide variety of fields, from its original focus on IT systems (Venkatesh and Davis, 2000) to mobile services (Wang et al. 2006), banking practices (Yousafzai et al. 2010), and e-book readers (Read et al. 2012). Advocates and critics alike note that TAM continues to occupy a central position in research on predicting and explaining adoption or rejection of a new technological system (Lee et al. 2003; Straub and Burton-Jones, 2007). Substantial theoretical and empirical support has accumulated in favor of the powerful and parsimonious explanation provided by TAM (Venkatesh, Davis, & Morris, 2007), with some suggesting that the model predicts about 50% of the variance in using new technology (King & He, 2006). The significance of such findings become salient when one considers that predicting 10% of the variance in the dependent variable is considered quite high in the social sciences (Cohen, 1992). King and He (2006) concluded from their meta-analysis of 88 TAM studies that "TAM is a powerful and robust predictive model" (p. 751).

Knowledge accumulation regarding the TAM model has been significant, driven largely by the extensive embrace within the academic community of its emphasis on two key factors: beliefs about ease of use and usefulness of the new technology. However, vital knowledge voids remain within the realm of TAM research. Researchers have noted that the empirical applicability and theoretical validity of TAM need to be expanded to incorporate different contexts, users, and contingencies (Lai and Li, 2005). Hartwick and Barki's 1994 probing analysis of TAM research revealed that there is little understanding of technology adoption for mandated, rather than volitional, technologies. This is an important omission because under mandated circumstances, employees have very limited or no decisional powers in regards to using a new technology (Ojiako et al., 2012). Little research has directly addressed this topic, prompting Benbasat and Barki (2007) to call for studies focused on investigating reactions to new technologies in mandatory use settings.

Another critical knowledge void in the TAM literature pertains to the lack of theoretical insights and empirical tests surrounding the role of non-demographic contingencies that impact user acceptance of new technological systems (Bogozzi, 2007). Much TAM research has simply proposed additional demographic moderators (e.g., gender, age) to explain technology acceptance under volitional conditions (Schwarz and Chin, 2007).

Our argument suggests that a focus on introducing behavioral constructs to the TAM model in mandatory contexts is warranted to illuminate factors and processes that make it more likely for a new technology to be adopted.

TAM under Mandatory Conditions

In mandated conditions organizations often require employees to start using the technology within a certain timeframe. The extent to which TAM tenets apply to mandated contexts is an important question because the TAM theoretical framework was originally conceived for volitional choices about use of a new technology (Bogozzi, 2007). Consequently, in mandated contexts, researchers and decision-makers are interested in user willingness for sustained engagement with the new technology (Schwarz and Chin, 2007).

TAM researchers indicate that perceived usefulness is a starting point for understanding attitudes about new technologies. Usefulness refers to the degree to which a person believes a certain technology will help perform a particular task or task set. Extensive existing research provides evidence of the significant and robust effect of beliefs about usefulness on usage intention (Ndubisi, 2005). We believe that perceived usefulness will make it easier to accept a mandated new technology. Thus, the easier a new technology is to use, the more acceptable it will be. We hypothesize:

H1: Higher perceived usefulness will lead to greater willingness to use a mandated technology.

Perceived ease of use refers to the degree to which prospective users expect the new technology to be effortless (Venkatesh and Morris, 2000). Users prefer new systems that are easy to learn and use. Several studies provide substantiation of the significant impact of perceived ease of use on usage intention, either indirectly or directly through its effect on perceived usefulness (Agarwal and Prasad, 1999; Straub and Burton-Jones, 2007). Lee et al. (2003) found that of the 101 studies they examined, 58 studies showed a significant relationship between perceived ease of use and usage intentions.

Technological systems that are easy to use are more readily acceptable as they alleviate the loss of control that is engendered in situations where people do not have free choice (Gagne and Deci, 2005). Systems that are seen as easy to use will be considered a net benefit to one's work, facilitating overall acceptance of the system. On the other hand, when a technology is considered difficult to use, one's sense of competence and ability will be undermined. In an attempt to regain their psychological balance (Kashdan and Steger, 2011), individuals will consider difficult to use technologies unacceptable. We hypothesize:

H2: Higher perceived ease of use will lead to greater willingness to use a mandated technology.

A key criticism of technology acceptance research has been its neglect of the influence of behavioral proclivities (King and He, 2007). For example, Adams et al., (1992) called for more research to be geared towards incorporating factors such as user characteristics in TAM. Benbasat and Barki noted that research around the topic of why some new technologies are (not) adopted tends to overlook points of intersections with key constructs in other fields, particularly with well-established theories and concepts explaining social and economic actions (2007). One purpose of the present investigation is to draw attention to the role of entrepreneurial proclivity in shaping individuals' reactions towards new technologies.

Entrepreneurially oriented individuals are likely to have different mental schemas than those who are not entrepreneurially oriented due to variations in the way they see the world and make sense of it (Krueger, 2005). Research suggests that entrepreneurial individuals exhibit personality and psychological traits that distinguish them from other more conservative individuals (Kraus et al., 2005). Therefore, their perceptions of usefulness and ease of use may have different implications for adoption of computer technologies (Ndubisi, 2007). Evidence indicates that organizations benefit when employees throughout the hierarchy demonstrate a willingness to behave entrepreneurially (Hornsby et al. 2002).

The leading conceptualization of what it means to 'behave entrepreneurially' is the extent of one's emphasis on specific proclivities – innovativeness and risk-taking – and whether such tendencies occur with some consistency (Wolfe and Shepherd, 2013). In other words, entrepreneurial orientation is revealed through a simultaneous emphasis on innovativeness and risk taking (Goktan & Gupta, 2013). It is now believed that EO entails "a holistic assessment of [specific] individual proclivity towards" navigating ambiguity and complexity (Goktan & Gupta, 2013).

Conceptually, we believe that entrepreneurial orientation increases the chances that a person will be inclined to use new technologies and facilitate sustained engagement with novel systems. Enterprising individuals who are open to creative ideas and willing to take risks in pursuing them will have fewer cognitive and interpersonal barriers to overcome in using new technologies. We are unaware of studies that have examined the direct link between EO and adoption of new technologies. Therefore, we propose that the openness to taking risks and experimenting might be reflected in embracing the challenges associated with unfamiliar systems outside of one's comfort zone. Based on this logic, we hypothesize:

H3: Individual entrepreneurial orientation will be positively associated with the willingness to use a mandated technology.

While the inter-relationships between TAM variables (i.e. usefulness, ease of use and behavioral intentions) have been strong, "there has been considerable variability, suggesting that moderator variables can help explain the effects" (King & He, 2006: 751). In understanding the role of individual entrepreneurial proclivity in facilitating commitment to a mandated technology via its effects on perceived usefulness and ease of use, we note that those who have an innate propensity towards entrepreneurial behaviors place greater emphasis on venturing beyond the current state of affairs to achieve their goals and being successful (Kollmann et al. 2008). This is especially true in environments undergoing significant changes. Beliefs about usefulness and ease of use can advance commitment to a new technology, but such effects may be limited. Entrepreneurial orientation can help overcome the limitations associated with following through on one's beliefs. For instance, people who perceive high ease of use and usefulness in a new system may simply focus on its technological features, but miss noticing latent opportunities for further advancement and instrumental achievement that come with using those systems (Hornsby et al. 2002). Individuals who are entrepreneurially oriented see opportunities that others cannot and they can go beyond accepting the technology and perceive other opportunities.

Perceived ease of use in combination with entrepreneurial orientation allows enterprising individuals to generate superior cost-benefit ratios for new technologies. Mandating adoption of a new technology puts pressure on organizational members to become familiar with it, and when combined with a psychological propensity to delve into new systems and practices, enterprising individuals are more likely to mentally accept the new technology for continued use. Similarly, entrepreneurial orientation allows people to stretch the perceived benefits of new technologies, including sometimes seeing new opportunities that are not visible to others (Chiles et al. 2007). Such a proclivity towards entrepreneurial behavior boosts the adoption effects associated with perceived usefulness as enterprising individuals focus on potential technological advantages that have not yet been recognized and take the lead in committing to new technologies. This reasoning would imply that entrepreneurial orientation is likely to positively shape the technology acceptance effects associated with beliefs about ease of use and usefulness in mandated situations; thus, we hypothesize:

H4: The relationship between perceived ease of use and willingness to use a mandated technology will be positively moderated by entrepreneurial orientation.

H5: The relationship between perceived usefulness and willingness to use a mandated technology will be positively moderated by entrepreneurial orientation.

Method

Research Site

The research question investigated in this study required us to collect data in a setting where use of a specific technology is mandated. We also sought to identify a technology that has been introduced recently so that we could avoid contamination from effects associated with practice and familiarity. Further, because prior research has shown that organizational factors can influence responses to new technologies, we chose to conduct an intra-organizational study. Finally, we wanted to collect data from "knowledge workers" with advanced educational qualifications to provide a conservative context for our research (Lewis, Agarwal and Sambamurthy, 2006).

Our conditions were met at a public university in the mid-western United States which had mandated a new digital technology for full-time instructors to update their annual records just months before the data collection effort started. The university guidelines stipulated that only information collected through the technology would be used for annual performance reviews.

Sample

A total of 149 individuals (79 men, 62 women, and 8 unreported) participated in the study. About twenty percent of the sample was between 30-40 years of age, 22% between 40-50 years, 32% in the 50-60 years range, and 20% above 60 years (5% unreported). In terms of ethnicity, about 80% self-reported as Caucasian, followed by Asian or Pacific Islander (5%), African American and Native American (1% each), and 8% were unreported. More than 80% of the respondents had a doctorate or equivalent, with the remainder having other advanced degrees. Respondents reported attending an average of two training sessions on the new digital technology (minimum of zero and maximum of 10).

Measures

Data on all variables were collected through a survey questionnaire on a seven-point Likert scale. Multi-item scales were used to measure the various constructs in this study. Before administration, the survey questionnaire was examined for face validity by a panel of academic experts and pilot-tested separately. Perceived ease of use (PEU), perceived usefulness (PU), and willingness to embrace new technology (WILL) were each measured separately through 3-item scales respectively (Nah et al. 2004). Because we were interested in measuring individual-level entrepreneurial orientation in a technology context, we used a 6-item scale derived from Stone and Good (2004). Cronbach alpha measurements for the various scales in our study were all above .85, which compares well with the alpha levels generally found in the TAM literature (King & He, 2006). Prior research suggests that respondent gender, work experience, and computer experience also influence adoption of new technologies (Lee et al. 2003), and were included as control variables.

Data were collected at a single point in time through a survey questionnaire and several steps were taken to address potential common method issues. In addition, all items loaded much more strongly on their substantive constructs than on the latent common method factor. Finally, we chose planning disposition, a variable theoretically unrelated to the dependent variable of willingness to use the new technology, as an identifier variable for the common method bias analysis (Lindell and Whitney, 2001); verified with a 95% sensitivity analysis. Overall, we believe that concerns related to common method bias are considerably lessened in this study.

Analyses and Results

We note that willingness to use the mandated technology (variable name 'WILL') is unrelated to gender and experience with computers, but negatively related to work experience. We also find that entrepreneurial orientation (EO) is unrelated to any of the study variables, including perceived ease of use (PEU), perceived usefulness (PU), and willingness to use the mandated technology. From Table 2, there is a high correlation of 0.92 between the independent variable 'perceived usefulness' and dependent variable 'willingness to use'. In such situations, it is necessary to assess discriminant validity before further analyses can be conducted (Farrell, 2009). Following Fornell and Larcker (1981) who state that "variance extracted estimates should be greater than the squared correlation estimate", we examine whether the average variance extracted for the two constructs in our study was greater than the squared correlation (r-square) between the two constructs. The r-square value for 'willingness to use' construct is lower than the average variance extracted (AVE) for 'perceived usefulness' and 'willingness to use', suggesting that discriminant validity is not a problem between the two constructs. A confirmatory factor analysis (see Table 1) also shows the items loading on their respective factors. Additionally, observing the AVE values of each construct we find that they are greater than 0.5, suggesting no convergent validity issues.

Table 1: Confirmatory Factor Analysis Loadings

	Factor 1	Factor 2	Factor 3	Factor 4
PEU1	0.907			
PEU2	0.801			
PEU3	0.943			
EO1		0.862		
EO2		0.974		
EO3		0.79		
EO4		0.293		
EO5		0.319		
EO6		0.294		
PU1			0.956	
PU2			0.939	
PU3			0.957	
WU1				0.968
WU2				0.981
WU3				0.867

Table 2: Descriptive Statistics, Correlation Matrix and AVE

Construct	1	2	3	4	5	6	7
1. EO	0.66						
2. PEU	0.29	0.78					
3. WILL	0.43	0.69	0.94				
4. PU	0.35	0.65	0.92	0.95			
5. Gender	0.016	0.116	0.121	0.148	NA		
6. Work Experience	-0.112	-0.242	-0.279	-0.29	-0.185	NA	
7. Computer Expereince	0.028	0.068	-0.054	-0.188	-0.115	0.26	NA
Statistics							
M	4.15	2.98	2.42	2.67	1.44	3.6	4.77
SD	1.07	1.59	1.69	1.82	0.49	1.29	0.6

Model Evaluation

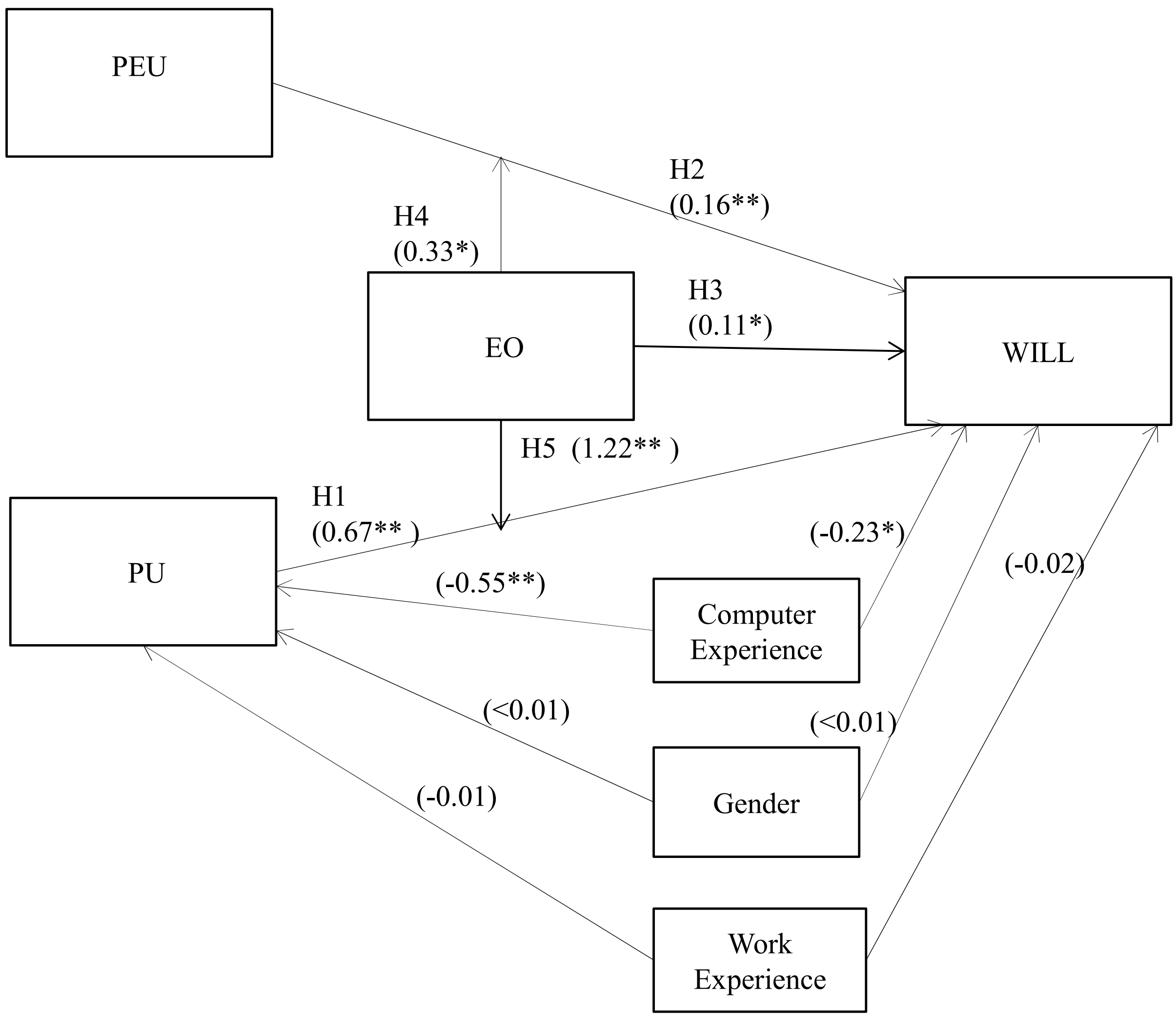
We used covariance-based structural equation modeling (CBSEM) for analyses. CBSEM makes a normal distributional assumption. Prediction-oriented parametric measures are used for evaluation of the CBSEM. Fit indices-, GFI (Goodness-of-Fit Index), RMSEA (Root Mean Square Error Approximation), AGFI (Adjusted Goodness-of-Fit Index), NFI (Normative Fit Index), TLI (Tucker-Lewis Index), SRMR (Standardized Root Mean Square Residual), and CFI (Comparative Fit Indices)- are reported in CBSEM. Chi-square is one of the several measures used in assessing the overall model fit, and "assesses the magnitude of discrepancy between the sample and fitted covariance matrices" (Hu and Bentler, 1999). A relative (or) normed chi-square ($\chi 2/df$; Wheaton et al. 1977) is used because of issues related to the large sample size. We use two-index presentation strategy by Hu and Bentler (1999) (see Table 3) as a basis for determining the overall model fit. A model is considered fit if any of three combination criteria specified by Hu and Bentler (1999) is satisfied.

Table 3: Model Fit Indices and Goodness of Fit Indices

Method	Model	Variable	R-Square	Chi-Square/ df	GFI	AGFI	NFI	CFI	TLI	RMSEA	SRMR
CFA	6-item EO	EO	NA	2.43*	0.97	0.89	0.98	0.99	0.97	0.09	0.03
CFA	3-item PU	PU	NA	0.6*	0.99	0.98	0.99	1	1	<0.01	<0.01
CFA	3-item WILL	WILL	NA	0.24*	0.99	0.99	1	1	1	<0.01	<0.01
CFA	3-item PEU	PEU	NA	3.43*	0.97	0.91	0.98	0.98	0.98	0.1	0.02
SEM	Moderation Model	1. EO	NA	1.55	0.88	0.81	0.92	0.96	0.96	0.06	0.06
		2. PEU	NA								
		3. WILL	0.87								
		4. PU	0.46								
		5. EO x PU	NA								
		5. EO x PEU	NA								
SEM	Base Model	1. EO	NA	1.70	0.88	0.82	0.92	0.96	0.96	0.07	0.08
		2. PEU	NA								
		3. WILL	0.87								
		4. PU	0.41								
	Goodness-of-fit Threshold			<3; >1	>0.95	>0.90	>0.90	>0.90	>0.90	<0.08	<0.09

Figure 1 below provides the hypothesized moderation model. For the moderation analysis all variables were standardized including the interaction variables, so as to alleviate multi-collinearity concerns. There were two models considered: (1) base model-no interactions (2) moderation model with interaction. A full information approach was used for the structural model because the sample size was sufficient to run the model.

Figure 1: Research Model with Moderation



A first step in the analysis, model fit, is evaluated by conducting CFA for each latent variable used in the model. We find from Table 4 that EO measurement model meets goodness-of-fit criterion, and combination criteria from Hu and Bentler (1999) (e.g. TLI > 0.96 and SRMR <0.09) is satisfied, indicating that the EO measurement model has an overall fit. From Table 4, we also find that the 3-item PU, PEU, and WILL measurement models meet goodness-of-fit indices, and satisfies all three combination criteria suggested by Hu and Bentler, indicating that the PU, PEU and WILL measurement models have a satisfactory overall fit.

Table 4: Path Coefficients of the Moderation Model

			Base Model			Moderation Model		
Paths			**Regression Weights**	**Standard Error**	**Critical Ratio (Z-Value)**	**Regression Weights**	**Standard Error**	**Critical Ratio (Z-Value)**
WILL	<---	PU	0.728	0.051	14.149**	0.67	0.06	11.79**
WILL	<---	EO	0.13	0.047	2.768**	0.11	0.05	2.36*
WILL	<---	PEU	0.15	0.057	2.648**	0.16	0.05	2.89**
WILL	<---	Gender	0.028	0.122	0.228	<0.01	0.119	<0.01
PU	<---	Gender	0.114	0.242	0.471	<0.01	0.218	<0.01
WILL	<---	Computer Experience	0.224	0.109	2.064*	0.225	0.105	2.13*
PU	<---	Computer Experience	-0.691	0.205	-3.375**	-0.546	0.186	-2.93**
WILL	<---	Work Experience	-0.003	0.05	-0.065	-0.017	0.049	-0.35
PU	<---	Work Experience	-0.107	0.098	-1.092	-0.0132	0.088	-1.50
PU	<---	EO x PU				1.22	0.254	4.78**
WILL	<---	EO x PEU				0.334	0.146	2.28*

Table 4 also presents the model fit indices and R-square values for SEM moderation and base models. The R-square for WILL is 0.87 and PU is 0.46 in the moderation model. Whereas the R-square for WILL is 0.87 and PU is 0.41 in the base model, we find that with the moderation model the R-square value of PU is slightly higher, justifying the reason for using the moderation model. Both in the base model and the moderation model, the normed Chi-square value falls within the acceptable range. Based on Hu and Bentler's two-index presentation strategy (Appendix), the base and moderation models are considered to have acceptable fit (RMSEA<0.06 and SRMR <0.09).

Assessing Hypothesis of Conceptual Model

The second step in the analysis is to find the path coefficients for the hypothesized moderation model. Results indicate a significant positive relation between PU and WILL ($\beta = 0.68$, $z = 14.46$, $p < 0.01$); Hypothesis 1 is fully supported. Results show a significant positive relation between PEU and WILL ($\beta = 0.16$, $z = 2.99$, $p < 0.01$); Hypothesis 2 is fully supported.

Hypothesis 3 is supported with direct paths from EO to WILL along with all control variables (gender, experience with computer, and work experience). The results show a significant positive relation between EO and WILL ($\beta = 0.11$, $z = 2.45$, $p < 0.05$).

Hypothesis 4 tests the moderating influence of EO on the relationship between PEU and WILL, assessed with direct paths from interaction factor (EO x PEU) leading to WILL along with all control variables (gender, experience with computer, and work experience). Hypothesis 4 is fully supported according to these results. Similarly, Hypothesis 5 tests the moderating influence of EO on the relationship between WILL and PU, assessed with direct paths from interaction factor (EO x PU) leading to WILL along with all control variables (gender, experience with computer, and work experience). Results show a significant positive relation between the interactive terms. Hypothesis 5 is fully supported.

Our results indicate that the moderator EO has a significant influence on the relationship between: (1) PEU and WILL, (2) PU and WILL. To find if the difference between the base model and the moderator model are statistically significant different, we find the difference in Chi-square and difference in degrees of freedom between the two models. The Δchi-square = 67.03 and $\Delta df = 48$, with p-value = 0.036, so the difference between the base and the moderation model is significant. Thus, addition of individual entrepreneurial orientation makes a significant difference to the model.

Discussion

The goal of this study was to explore the role of individual-level entrepreneurial orientation in shaping reactions to mandated use of a new technology. Results offer strong support for the contingent influence of individual-level entrepreneurial orientation in understanding reactions to the mandated use of a new technology.

Our primary contribution pertains to the finding that the two constructs of perceived usefulness and ease-of-use do not capture the whole story. As hypothesized, our results indicate a significant interaction between individual entrepreneurial orientation, perceived ease-of-use and usefulness, and willingness to engage with the mandated technology. Specifically, individual entrepreneurial orientation boosted willingness to use the new technology, as well as interacted with perceived usefulness to strengthen willingness towards technology usage. Results indicate that incorporating EO explains an additional 24.3% variance in technology adoption.

Several TAM studies disregarded moderating effects of individual factors, although some admit that the lack of such characteristics is an inadequacy of their research (Sun and Zhang, 2006). Our finding about the moderating role of entrepreneurial orientation supports the arguments of Bagozzi (2007) that scholars should note, and provide conceptual and empirical justification for, the role of individual-level contingencies in explaining reactions to new technologies. As EO is likely to engage considerable cognitive resources, its potentially beneficial role in adopting new technologies brings some negative implications. Yet, the greater flexibility, adaptability, and openness to unexpected change it offers (Kollmann et al. 2008) seem to enable better alignment of perceived usefulness and perceived ease-of-use with the willingness to use a new technology.

This study also advances research on entrepreneurial orientation in several ways. First, we combine insights from the emerging EO literature with well-established theoretical frameworks. Encouragingly, the EO concept has a useful role in the further theory development from other disciplines, as we found here. Second, our research introduces a new dependent variable- reaction to a new technology- to the entrepreneurial orientation literature. While extant research has largely examined performance outcomes associated with entrepreneurial orientation (Krauss et al., 2005), we theoretically derive and empirically validate reactions to new technologies as one consequence of entrepreneurial orientation. Studies that draw attention to previously unexplored outcomes of entrepreneurial orientation expand the nomological net in new directions and unearth new applications for the construct.

Practically the present study informs organizational decision-makers and policy-makers interested in rolling out new technologies for knowledge workers about the importance of their employees' individual characteristics. Without consideration of employees' entrepreneurial orientation, the potential of new technologies may not be fully realized and workers may not meaningfully engage with them. It follows that administrators and managers should encourage development of entrepreneurial skills among employees across organizational levels. Organizations would benefit from employees who have a greater appreciation for and understanding of entrepreneurial orientation and its role in advancing individual and organizational interests. Organizations that make systematic investments in promoting and developing entrepreneurial orientation among employees are likely to accrue higher returns from their investments in new technologies.

Limitations and Directions for Future Research

This study has limitations that may open new avenues for further research. First, all survey research, including the one reported here, follows the variance-theoretic tradition in the social sciences, as it involves using statistical techniques to test predicted links between specific variables (Chiles, Bluedorn and Gupta, 2008). Variance research may not be suitable for in-depth exploration of the various processes through which new technologies are accepted or shunned in the daily lives of knowledge workers (Sun and Zhang, 2006). Process-theoretic research techniques, for example narrative approaches, may be used to understand the actual experiences of knowledge workers under particular circumstances, such as mandatory use (Elliott, 2005: 6). We believe the use of techniques like narratives will help foster a stronger understanding of the role of individual entrepreneurial proclivity in shaping reactions to using new technologies.

Second, our research design is in essence a snapshot in time. Static approaches assessing attitudes towards new technologies at one point in time are not able to track changes over time. Few organizational studies take a temporal perspective- examining ways that events (in our case, reactions to new technologies) unfold across time. Studies are needed to advance knowledge about changes in adoption of new technologies over time (Venkatesh et al. 2007). Future research should seek to capture the complex evolutionary nature of technology acceptance, particularly shifts in perceptions over time.

Conclusion

This study assimilates the theories of technology acceptance research and entrepreneurship research to show that employees' proclivity towards entrepreneurial activities is an important factor in understanding reactions to new technologies in mandated contexts. In spite of its wide recognition among researchers as a key contributor to individual propensity to identify and pursue new opportunities, entrepreneurial orientation has remained unstudied within the technology acceptance framework. The 21st-century business environment requires organizations to introduce and promote new technological systems to remain competitive, increase the efficiency and effectiveness of their processes and derive performance advantage (Bettis & Hitt, 1995). Individual entrepreneurial orientation can be an effective part of this response. The empirical support we found among a sample of knowledge workers enhances our confidence in the validity of our research. Testing the hypotheses in varied contexts, such as in other organizations and across countries, will likely advance the generalizability of the findings presented here.

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